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PINE SAWFLY LARVAE DESTROY SHORTLEAF PINE STROBILI IN VIRGINIA

Current studies of shortleaf pine seed production at the Lee Experimental Forest in the Virginia Piedmont have shown that insects can seriously reduce the number of female strobili during the 2-year development period.

Well-known insects attacking pine flowers, cones, and seed include species of thrips (Gnophothrips), coneworms (Dioryctria), and seedworms (Laspeyresia).[1] Although larva of the pine sawfly, Neodiprion pratti pratti (Dyar), is known primarily as a defoliator, occasional feeding on twig bark and "developing buds" of pines in Virginia has been reported.[2] Observations of cone production of shortleaf pine for the past 2 years at the Lee Experimental Forest indicate that this insect frequently feeds on both male and female strobili as well.

Male strobili were damaged by sawfly larvae that ate away portions of the catkins before pollen release. The amount of the pollen crop damaged by sawfly larvae was not determined, but apparently the loss of pollen is not great. On the other hand, damage to female strobili and the resulting mortality can be very serious because each conelet contains approximately 90 ovules capable of becoming sound seeds at maturity.

During the spring of 1963 a survey of 416 shortleaf pine female flowers from 23 trees revealed that 9.6 percent of the flowers were killed by sawfly larvae (table 1). The following spring 3,423 flowers on 20 trees were examined and the mortality from sawfly larvae was 3.8 percent. Although more female flowers were killed by sawfly larvae in 1964 than in 1963, the percentage of flower mortality attributable to the sawfly was low in 1964 because of the exceptionally large flower crop.

Female strobili were destroyed while the flower was still enclosed in the bud scales and also after emergence from the scales. Before the bud scales opened, the sawfly larvae killed the flowers by eating large portions of the buds. After emergence, the flowers were often eaten away in chunks on the sides, top, or stalk (fig. 1). Apparently the larvae feed on both the male and female strobili concomitantly with feeding on the needles. It is not known whether the larvae actually prefer female buds or flowers or if, in their search for needles, they merely eat the strobilus tissue as they come to it. The degree of damage to female strobili on a twig or branch, however, seems roughly proportional to the severity of needle defoliation.

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[1] Ebel, Bernard H. Insects affecting seed production of slash and longleaf pines - their identification and biological annotation. Southeast. Forest Expt. Sta., U. S. Forest Serv. Res. Paper SE-6, 24 pp. 1963.

[2] Morris, Caleb L., Schroeder, William J., and Bobb, Marvin L. A pine sawfly Neodiprion pratti pratti (Dyar) in Virginia. Va. Div. Forestry, 42 pp. 1963.

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Figure 1.--Sawfly damage to female strobili of shortleaf pine.

A, sawfly larvae feeding on needles of shortleaf pine after severely damaging female strobili and vegetative buds.

B, severe damage to female strobilus by sawfly larvae.

C, female strobilus on the left did not develop into a receptive flower because of sawfly damage. The flower on the right was not damaged.

Table 1.--Shortleaf pine female flowers killed by sawfly larvae

Year of survey	Trees sampled	Female flowers examined	Female flowers killed by sawfly larvae	
	----- Number -----		Number	Percent
1963	23	416	40	9.6
1964	20	3,423	130	3.8

Larval populations of the Virginia pine sawfly in central Virginia were considered light in both 1963 and 1964.[3] Nonetheless, sawfly damage reduced the potential seed crops for these years by killing female strobili, and it is probable that mortality of female strobili would be much greater during an epidemic year.

[3] Personal communication with William J. Schroeder, Entomologist, Virginia Division of Forestry, October 20, 1964.

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